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THE MAGIC FIELD CAMPAIGN IN THE EASTERN NORTH PACIFIC

E. R. Lewis

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Environmental Sciences Department/Atmospheric Sciences Division
Brookhaven National Laboratory
P.O. Box, Upton, NY
www.bnl.gov

ABSTRACT

The MAGIC field campaign, funded and operated by the ARM (Atmospheric Radiation Measurement) Climate Research Facility of the US Department of Energy, occurred between September, 2012 and October, 2013 aboard the Horizon Lines cargo container ship *Spirit* making regular trips between Los Angeles, CA and Honolulu, HI. Along this route, which lies very near the GPCI (GCSS Pacific Cross-Section Intercomparison) transect, the predominant cloud regime changes from stratocumulus near the California coast to trade-wind cumulus near Hawaii. The transition between these two regimes is poorly understood and not accurately represented in climate models. The goal of MAGIC was to acquire statistics of this transition and thus improve its representation in models by making repeated transects through this region and measuring properties of clouds and precipitation, aerosols, radiation, and atmospheric structure. To achieve these goals, the Second ARM Mobile Facility (AMF2) was deployed on the Horizon *Spirit* as it ran its regular route between Los Angeles and Honolulu. AMF2 consists of three 20-foot SeaTainers and includes three radars, lidars, a ceilometer, microwave radiometers, a total sky imager, disdrometers, and other instruments to measure properties of clouds and precipitation; a condensation particle counter, a cloud condensation nuclei counter, an Ultra-High Sensitivity Aerosol Spectrophotometer UHSAS), a nephelometer that operates under ambient conditions and controlled relative humidity at three wavelengths, and a Particle Soot Absorption Spectrometer operating at three wavelengths, to measure properties of aerosols; a Precision Spectral Pyranometer, a Sunshine Pyranometer, a Precision Infrared Radiometer, a Fast-Rotating Shadowband Radiometer, a Solar Array Spectrophotometer, and other instruments to measure properties of radiation; and instruments to measure meteorological quantities and sea surface temperature. Two technicians accompanied the AMF2, and scientists rode as observers. Radiosondes were routinely launched four times per day, and during one round trip in July, 2013 eight radiosondes were launched each day. In total, more than 500 soundings were made. MAGIC made nearly twenty round trips between Los Angeles and Honolulu (and thus forty excursions through the stratocumulus-to-cumulus transition) and spent nearly 200 days at sea, and thus collected an unprecedented data set over this climatically important region. An overview of the deployment, preliminary results, and future plans will be presented.